

AMATEUR RADIO DIGITAL COMMUNICATIONS

On-Ramps to Learning Tech

And other lessons from the road

(Many of which can be applied to Amateur Radio)

TAPR DCC

17 September 2022

Hello!



- Rosy Schechter, KJ7RYV
- Executive Director, ARDC
- MS Digital Media, GA Tech
- Curriculum and educational writing, web design, project & nonprofit management, open data

Hello!



- Rosy Schechter, KJ7RYV
- Executive Director, ARDC
- MS Digital Media, GA Tech
- Curriculum and educational writing, web design, project & nonprofit management, open data

MAP LOVER! ❤️

ARDC's Mission

To support, promote, and enhance digital communication and broader communication science and technology, to promote Amateur Radio, scientific research, experimentation, education, development, open access, and innovation in information and communication technology.

Big Question

How do we get more people (esp. underrepresented groups like women, people of color, and young people) involved in amateur radio?

Today let's look at...

- Examples from other technical fields have addressed similar questions
- Some qualities that these projects share
- Some ARDC grantees that embody these qualities

Inspiration: Lyzi Diamond



<http://lyzidiamond.github.io/onramps>



**But there is a
disconnect. It is
difficult to join an
open source
community as a
beginner...**

<http://lyzidiiamond.github.io/onramps>

**... and it's difficult
for an open source
community to
open itself up to
beginners.**

Why? Open
source is meant
to be **accessible**
by nature. And it
is, **technically**.

**But not
always
conceptually.**

In 1997, **Eric Raymond** published an essay called **"The Cathedral and the Bazaar"**.

This is considered one of the seminal programming texts. It is an essay in praise of open source, particularly in the Linux community.

<http://lyzidiamond.github.io/onramps>

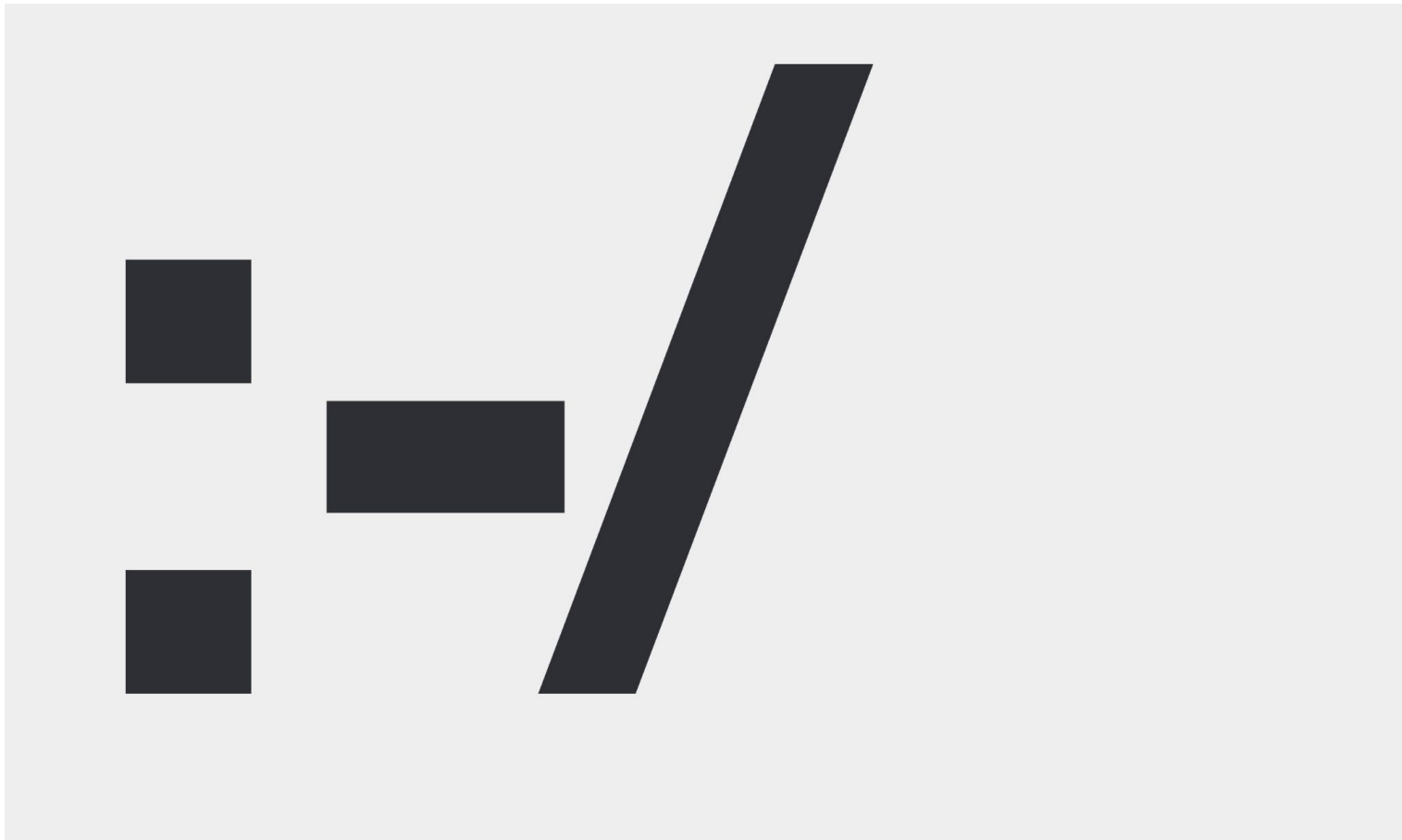
The essay is
full of **quotes**
like this:

<http://lyzidiamond.github.io/onramps>

"A certain base level of design and coding skill is required, of course, but I expect almost anybody seriously thinking of launching a bazaar effort will already be above that minimum. The open-source community's internal market in reputation exerts subtle pressure on people not to launch development efforts they're not competent to follow through on. So far this seems to have worked pretty well."

**"So far this
seems to
have worked
pretty well."**

<http://lyzidiamond.github.io/onramps>



<http://lyzidiiamond.github.io/onramps>

What can be done to overcome both technical and conceptual barriers to entry to open source and related communities?

#maptime!

Maptime



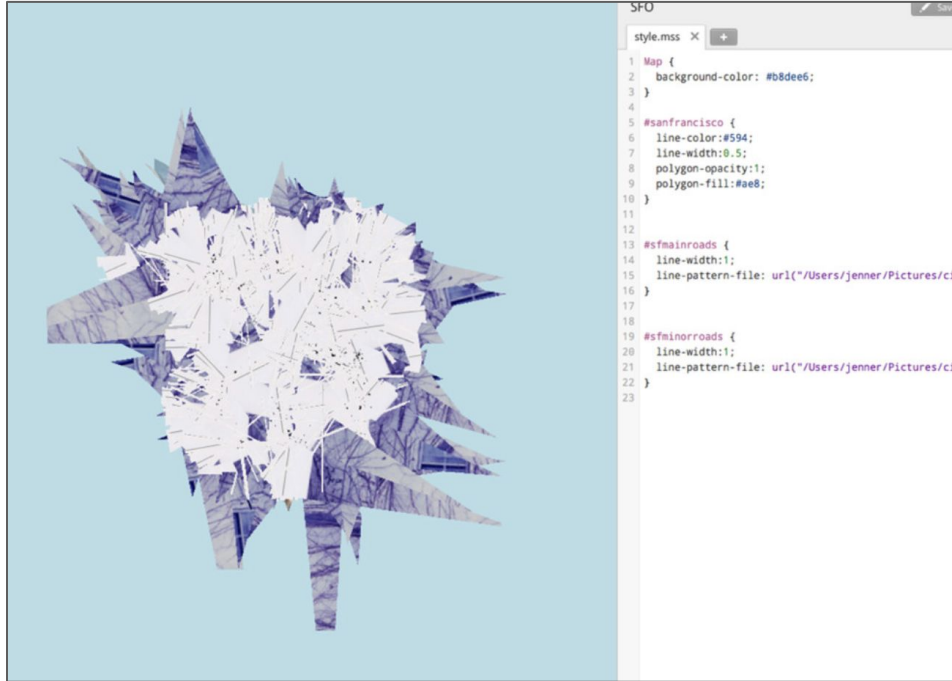
- Co-learning
- Mentorship
- No stupid questions
- Meet people where they're at
- Snacks provided
- All are welcome!

Maptime



- Experimentation encouraged
- Messing up encouraged as an opportunity for learning

Maptime



- Experimentation encouraged
- Messing up encouraged as an opportunity for learning

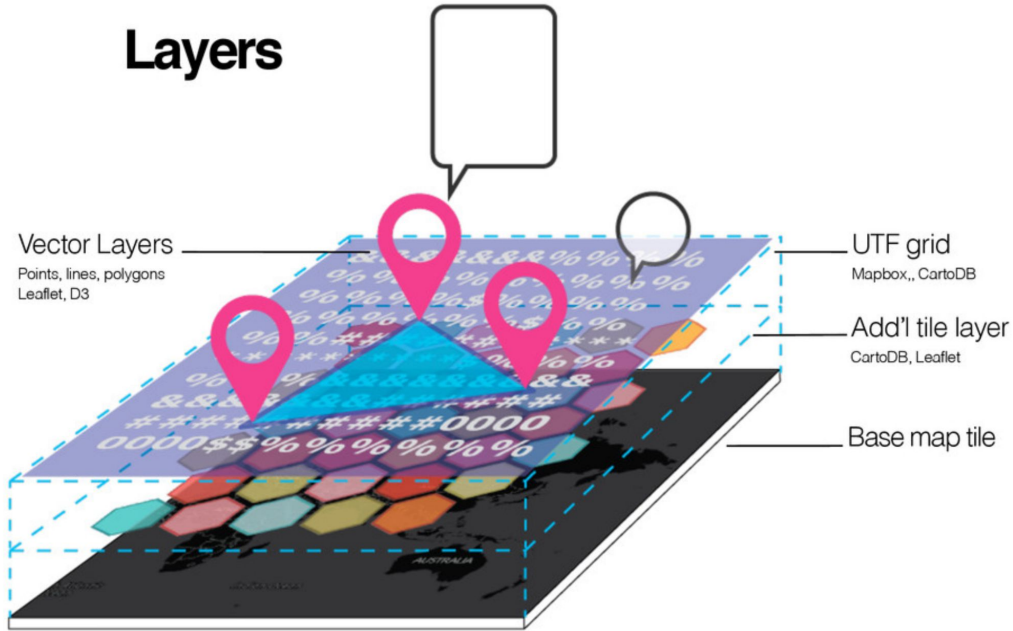
Maptime



Onramps to learning:

- Art & design
- Programming (esp. Python, JavaScript)
- Data science
- Cartography
- Geographic Information Systems (GIS)
- Geo Databases

Maptime



Break it down to
basics!

<https://speakerdeck.com/bethschechter/web-mapping-101>



AMATEUR RADIO DIGITAL COMMUNICATIONS

Maptime

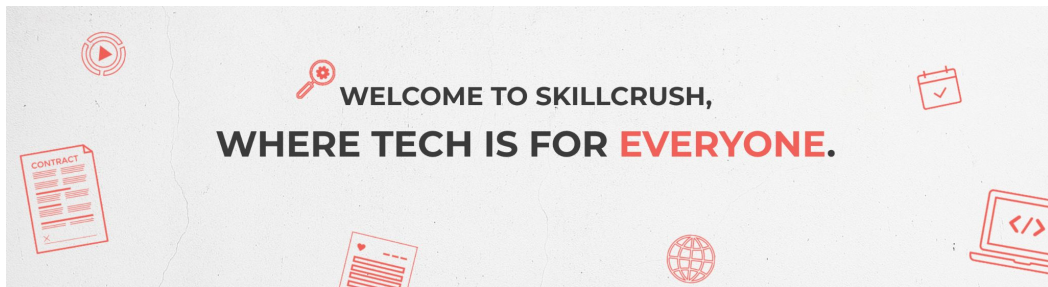


skillcrush



AMATEUR RADIO DIGITAL COMMUNICATIONS

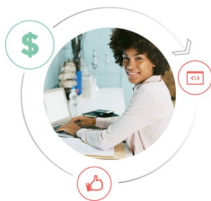
Skillcrush



ABOUT SKILLCRUSH

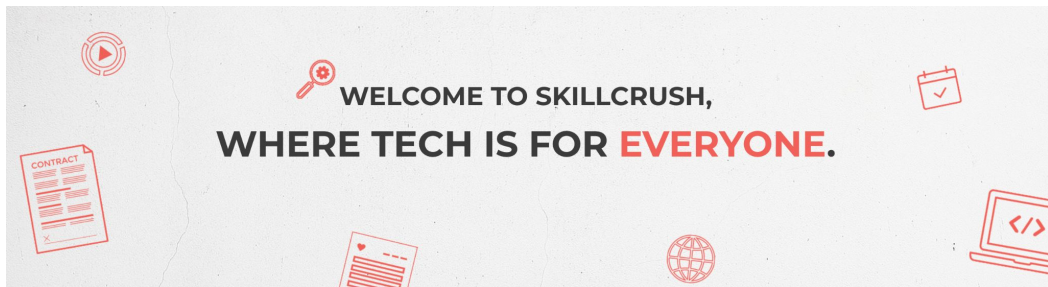
OUR MISSION

We believe that technology doesn't have to be so hard—and that tech is a tool that anyone can use. Our goal is to improve our students' quality of life through digital empowerment and skills to enter high-earning and flexible careers. Our community of students, alumni, and instructors will support you as you go from total tech newbie to tech pro. We are specifically focused on getting more women, people of color, LGBTQ+ people, people with disabilities, people without college degrees, parents and caretakers, or people who've taken long breaks from the workforce into the tech world. If you feel like there's no place for you in tech because you've never seen someone like you represented, we understand—and want you to know that you are so, so welcome here.



- Women-focused
- All are welcome!
- Meet people where they're at
- Mentorship
- No stupid questions!
- Job-seeking support
- Low cost
- Breaks it down to basics!

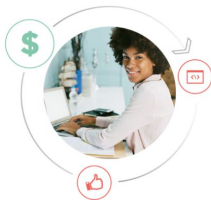
Skillcrush



ABOUT SKILLCRUSH

OUR MISSION

We believe that technology doesn't have to be so hard—and that tech is a tool that anyone can use. Our goal is to improve our students' quality of life through digital empowerment and skills to enter high-earning and flexible careers. Our community of students, alumni, and instructors will support you as you go from total tech newbie to tech pro. We are specifically focused on getting more women, people of color, LGBTQ+ people, people with disabilities, people without college degrees, parents and caretakers, or people who've taken long breaks from the workforce into the tech world. If you feel like there's no place for you in tech because you've never seen someone like you represented, we understand—and want you to know that you are so, so welcome here.



Onramps to learning:

- Visual design
- UI & UX
- Front-end coding
- Python



AMATEUR RADIO DIGITAL COMMUNICATIONS

Skillcrush

THESE STUDENTS GOT THE *JOB!*



OVER 90%

OF STUDENTS RECEIVED JOBS

This data is preliminary & based on the results of our beta test.

10 WEEKS

AVERAGE TIME TO LAND A JOB

This data is preliminary & based on the results of our beta test.

Thousands of women in tech jobs.

It cost them a few hundred dollars, about 100 hours in class, and likely an internship.

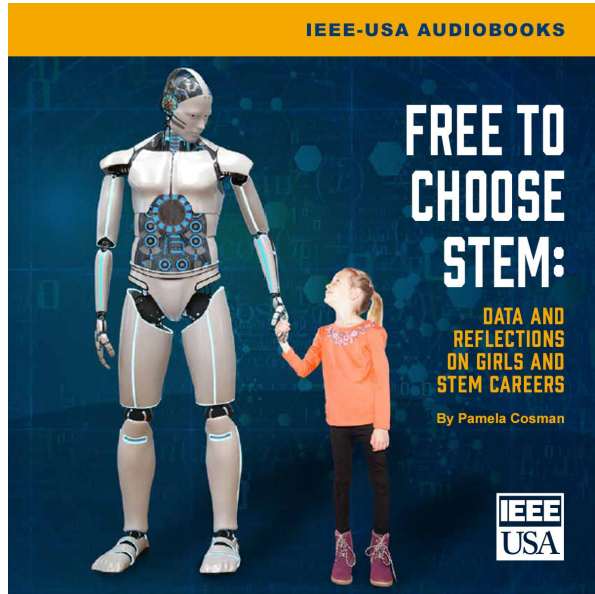


AMATEUR RADIO DIGITAL COMMUNICATIONS

What are the key ingredients?

	Maptime	Skillcrush
Cost	Free (led to volunteer burnout)	Low-cost (+ free coding camp)
Beginner-focused	✓	✓
Welcoming environment	✓	✓
Meet people where they're at	✓	✓
Peer Mentorship	✓	✓
Hands-on learning	✓	✓
Multiple on-ramps!	✓	✓
Financial support		Scholarship program
Support for next steps		✓
Underrepresented-group focused		✓
Open source focus	✓	

IEEE also notes...



To support getting women into STEM:

- Girls-only spaces for middle and high school students
- Growth vs Fixed Mindset
- Addressing imposter syndrome

<https://insight.ieeeusa.org/articles/new-ieee-usa-audiobook-explores-understanding-the-engineering-gender-gap/>

On-Ramps into Amateur Radio

- Radio Astronomy
- Electrical Engineering
- Emergency Services & Communications
- Off-Grid Living
- Citizen's Band (CB) & Shortwave Listening
- IT & Networking
- Open Source
- Hacking / Makerspaces

On-Ramps into Amateur Radio

- Radio Astronomy
- Electrical Engineering
- Emergency Services & Communications
- **Off-Grid Living ← this is my on-ramp**
- Citizen's Band (CB) & Shortwave Listening
- IT & Networking
- Open Source
- Hacking / Makerspaces

**It's great to see some ARDC grantees
putting these ideas into practice :)**

...and I didn't even have to say anything! ;)

M.O.R.E Project



“The Make Operating Radio Easier (MORE) Project is an initiative to reduce both gender and age imbalances in Amateur (Ham) Radio, through education and hands-on activities.”

Dr. Rebecca Mercuri
<http://n2re.org/m-o-r-e-project>

M.O.R.E Project



Dr. Rebecca Mercuri
<http://n2re.org/m-o-r-e-project>

Beginner-focused	✓
Welcoming environment	✓
Meet people where they're at	✓
Peer mentorship	✓
Hands-on learning	✓
Multiple on-ramps!	✓
Financial support	✓
Support for next steps	
Underrepresented-group focused	✓
Open source focus	Open access paper

M.O.R.E Project



Dr. Rebecca Mercuri
<http://n2re.org/m-o-r-e-project>

- Multiple training locations in progress
- First 10 students have passed training, with 20 in the queue



OUTREACHY

Outreachy provides **internships in open source and open science**. Outreachy provides internships to people subject to systemic bias and impacted by underrepresentation in the technical industry where they are living.

 **Paid** - \$7,000 USD total internship stipend

 **Remote** - both interns and mentors work remotely

 **3 months** - internships run May to August, or December to March

<https://www.outreachy.org>

OUTREACHY

Beginner-focused	✓
Welcoming environment	✓
Meet people where they're at	✓
Peer mentorship	✓
Hands-on learning	✓
Multiple on-ramps!	✓
Financial support	✓
Support for next steps	✓
Underrepresented-group focused	✓
Open source focus	✓

OUTREACHY



2021: 61 paid internships

- Subjects include open science, open humanitarian work, as well as general open source development
- Selected from over 2600 applications

<https://www.outreachy.org>

Society of Women Engineers (SWE)



Over **30 scholarships** for EE/ET degrees for women, half of which went to people of color. Plus:

- SWE Next High School Leadership Academy (SHLA) – 360 high school girls
- Collegiate Leadership Institute (CLI) – 129 women participants
 - Research re: underrepresentation of women of color in engineering – 178 participants, 21 from HBCUs and HSIs

Society of Women Engineers (SWE)



Beginner-focused	✓
Welcoming environment	✓
Meet people where they're at	✓
Peer mentorship	✓
Hands-on learning	College?
Multiple on-ramps!	✓
Financial support	✓
Support for next steps	✓
Underrepresented-group focused	✓
Open source focus	Open research

So many more!

Some are even here at DCC



National Radio Astronomy Observatory (NRAO)

Beginning instruction for LGBTQIA+ and BIPOC students for technician & general licenses, including:

- Intro to radio technologies,
- Scalable curriculum to be shared nationwide (and internationally), and
- Hands-on activities that will deepen their subject knowledge.

So many more!

Some are even here at DCC



Bridgerland Amateur Radio Club (BARC)

Introduce youth to amateur radio and engage them in activities themed around space science and technology.

- Portable ground station; ISS contacts.
- Hands-on satellite workshops for youth ages 11-17
- Educational events about how to find, track, and communicate through amateur satellites.

**Want more people in amateur radio?
Here's what to do.**



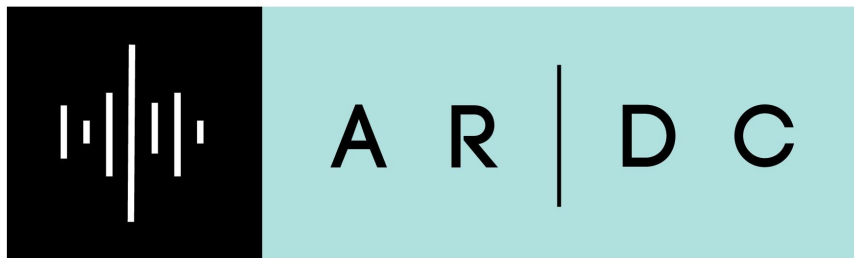
AMATEUR RADIO DIGITAL COMMUNICATIONS

**Let's identify some
comfortable
introductions to
geospatial open
source.**

<http://lyzidiomond.github.io/onramps>

**Let's identify some
comfortable
introductions to
amateur radio &
digital communications!**

<http://lyzidiiamond.github.io/onramps>



AMATEUR RADIO DIGITAL COMMUNICATIONS

Thank you!

Reach out any time: contact@ardc.net